

this table it should be borne in mind that the figures showing apparent paths and velocities are quite uncertain at times, owing to the impossibility of locating any clear track. These velocities must be taken with a great deal of allowance, and must not have ascribed to them any extreme accuracy. Till we know more of the constitution and mechanism and cause of motion of these conditions in the upper air we must continue to grope in the dark and study apparent results as indicated by our weather maps. Indeed it is by no means unimaginable that we are dealing with several systems actually existing one above the other, and yet projected in a single system or bendings of isobars upon our weather maps.

The observations of wind velocity on Mount Washington during the passage of highs have shown that when the wind is of moderate velocity or steadily diminishes on the approach of a high, there will invariably be a very marked rise in pressure, often a greater rise than at the base. On the other hand, if the wind maintains its velocity as the high advances, the rise in pressure is slight, or almost unnoticeable. Here we have a slight indication of the constitution of the so-called high.

*Movements of centers of areas of high and low pressure.*

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
<b>High areas.</b>										
I.	1, a. m.	44	90	8, a. m.	48	64	3,630	7.0	519	21.6
II.	5, p. m.	51	98	7, p. m.	49	82	830	2.0	415	17.3
III.	5, p. m.	42	126	11, a. m.	41	86	2,680	5.5	487	20.3
IV.	8, a. m.	41	126	22, a. m.	38	80	6,460	14.0	463	19.4
V.	30, a. m.	44	123	26, a. m.	43	64	4,310	6.0	719	30.0
VI.	21, p. m.	42	123	27, p. m.	36	73	3,390	6.0	565	23.5
VII.	26, p. m.	52	116	30, p. m.	38	73	3,170	4.0	794	33.1
Sums.....							24,470	44.5	3,965	165.2
Mean of 7 paths.....									566	23.6
Mean of 44.5 days.....									550	22.9
<b>Low areas.</b>										
I.	1, a. m.	51	111	5, p. m.	46	87	2,330	4.5	518	21.6
II.	4, p. m.	52	116	13, a. m.	49	53	4,610	8.5	543	22.6
III.	9, p. m.	37	109	14, p. m.	39	70	3,840	5.0	769	32.0
IV.	12, a. m.	53	116	13, p. m.	51	98	3,770	1.5	513	21.5
V.	13, p. m.	52	113	16, p. m.	39	100	1,590	3.0	530	22.1
VI.	18, p. m.	53	112	22, p. m.	47	59	2,750	4.0	688	28.7
VII.	21, p. m.	51	116	26, p. m.	51	67	2,500	5.0	500	20.8
VIII.	26, p. m.	52	101	30, a. m.	50	63	1,960	8.5	559	23.3
Sums.....							20,350	35.0	4,620	.....
Mean of 8 paths.....									578	24.1
Mean of 35 days.....									581	24.2

A short description is here given of each high and low noted during June.

**HIGH AREAS.**

I.—Unlike the lows, four of the highs took their origin from the north Pacific Coast. It is probable that the permanent high pressure in the south Pacific had moved to the north, and these highs were split off from that. No. I was first noted a. m. of 1st in Wisconsin; its path was to the east for seven days, and it was last seen in the Gulf of St. Lawrence 8th, a. m.

II.—First noted in Manitoba p. m. of 5th; its motion was east for two days, and was last noted to the north of Lake Superior p. m. of 7th.

III.—First seen off the middle Pacific Coast 5th, p. m.; its motion was at first east, then east-southeast, and was last seen in Indiana a. m. of 11th.

IV.—First noted off the middle Pacific Coast 8th, a. m.; its motion was southeast to Texas, where it turned 13th, p. m., to northeast, and then southeast, disappearing off the south Atlantic Coast 22d, a. m.

V.—Was first noted in north Oregon 20th, a. m.; its motion was nearly eastward for six days, and was last seen off the Nova Scotia coast 26th, a. m.

VI.—First noted off the north Pacific Coast 21st, p. m.; its motion was a little south of east, and it was last seen off the middle Atlantic Coast 27th, p. m.

VII.—Was first noted to the north of Montana 26th, p. m.; its course followed high No. VI, and disappeared off the middle Atlantic p. m. of 30th.

**LOW AREAS.**

I.—With a single exception, No. III; all the lows of this month have taken their origin in the region to the north of Montana; it is probable that there was a rather permanent area of low pressure in this region, and each depression system was split off from this permanent low or locus of low pressure; No. I started 1st a. m., moved eastward, and was last noted in upper Michigan 5th, p. m.

II.—First noted, 4th, p. m.; its motion was eastward for 8.5 days, and was last noted over Newfoundland a. m. of 13th.

III.—First noted in Colorado, p. m. of 9th; its path was at first north than east, and it finally disappeared off the middle Atlantic Coast p. m. of 14th.

IV.—First noted a. m. of 12th, and moved for only one and a half days eastward; it was seen last in Manitoba p. m. of 13th.

V.—First noted p. m. of 13th; its motion was south-south-east for three days, and it was last seen in Kansas 16th, p. m.

VI.—First noted p. m. of 18th; its motion was east for four days, and it was last seen off Nova Scotia 22d, p. m.

VII.—First seen p. m. of 21st; its motion was eastward, almost in the path of No. VI for five days; it was last seen at the mouth of the St. Lawrence 26th, p. m.

VIII.—First seen 26th, p. m.; it moved for 3.5 days eastward, and was last noted at the mouth of the St. Lawrence a. m. of the 30th; nearly the whole path of the last three storms was to the north of the stations of observation.

**LOCAL STORMS.**

By A. J. HENRY, Chief of Division of Records and Meteorological Data.

There were a large number of severe thunderstorms, often accompanied by hail, during the month. The dates on which no severe thunderstorms were reported were: 1st, 2d, 10th, 11th, 12th, 19th, 26th, 28th, 29th, 30th.

No severe tornadoes occurred during the month, but minor tornadoes were reported in South Dakota on the 6th; near Oshkosh, Wis., on the 8th; at Wyeth, Ala., on the 9th; at Nutley, N. J., on the 21st, near Clayton, Wis., on the 24th, and at West Louisville, Ky., on the 27th. The record by dates is as follows:

3d.—Severe thunderstorms in the vicinity of Cincinnati, Ohio. Telegraph and telephone lines fences, and outbuildings damaged.

4th.—Severe hailstorms near Pender and Lincoln, Nebr.; heavy rains, accompanied by wind and hail, in central Kansas and in portions of Iowa, Indiana, Ohio, and Kentucky.

5th.—Heavy rain and hail storms, with high winds, in North Loup Valley, Nebr. The valley was flooded for miles; bridges, fences, and railroad tracks were washed away. Heavy rains also fell in the vicinity of Deadwood and Rapid City, S. Dak.; in Minnesota, Wisconsin, Iowa, the Missouri Valley, and in Ohio. The damages were generally confined to growing crops, bridges, and fences.

6th.—Severe windstorms were reported near Brazil, Ind., and in Daviess County, Mo. At Lynch, Nebr., a heavy wind blew down several buildings; loss, \$1,000. A minor tornado passed through the town of Wentworth, Lake County, S. Dak.; the damage was light—not over \$500. Virgil and Cavour, Beadle County, were visited by severe local storms, having some of the characteristics of tornadoes; the money value of property destroyed was about \$1,500.

7th.—Hail and high winds caused some damage near Bluffton, Ind. Mexico, Mo., was visited by a severe wind and rain storm; buildings in the lowlands were flooded to a depth of 3 feet, and some damage was done to frail structures by the wind. Heavy rains and high winds were also reported at Cleveland, Chicago, and Leavenworth, Kans.; four persons were drowned in a culvert at the last-named place.

8th.—Local storms of greater or less intensity prevailed throughout Wisconsin, and a minor tornado was observed in Winnebago County; it destroyed a barn in its path and disappeared over Lake Winnebago.

9th.—A minor tornado passed through Wyeth City, a suburb of Guntersville, Ala., wrecking 5 frame houses, injuring 5 persons, and damaging property to the extent of \$5,000. The storm path was about 200 yards wide. No other tornadoes were reported in this region, but a severe thunderstorm prevailed throughout eastern Tennessee, being especially violent in portions of Cocke County, where it is reported thousands of trees were blown down, buildings were damaged, and one person injured. Thunderstorms accompanied by hail were also reported from North Carolina.

13th.—Hail ruined the crops over a strip of country in Wake County, N. C.

14th.—High winds and tides prevailed on the New Jersey coast early in the morning of the 14th. The force of the winds was so great that several persons were blown overboard from wharves and vessels. The New England coast was also swept by unusually strong winds on the same date.

15th.—Severe thunderstorms were noted in portions of Maryland and Wisconsin.

16th.—High winds swept over portions of Nebraska. One dwelling and several small buildings were destroyed, one person killed, and three injured at Republican City, Nebr. An incipient tornado cloud was observed near Bismarck, N. Dak., on the same date; no damage.

17th.—A strong wind created much alarm and some damage to property at Guthrie, Okla. Portions of Payne, Noble, and Logan counties, in the same Territory, were also visited by a severe wind storm. Damage confined to crops and fences.

18th.—A waterspout was observed about one-half mile beyond the Charleston jetties, Charleston harbor, moving slowly northeastward.

20th.—Severe thunderstorms were observed in Wisconsin.

21st.—Severe thunderstorms occurred at St. Louis and Macomb, Mo. At the first-named place it was reported that property was damaged to the extent of \$10,000. The storm was also felt in Iowa, Indiana, and Ohio. Violent thunderstorms also prevailed in northern New Jersey, eastern New York, and New England, and an incipient tornado was reported as having occurred at Nutley, N. J. Considerable damage was done by a severe thunderstorm at Poughkeepsie, N. Y., and also in the Nashua Valley, N. H. The damage at Poughkeepsie was estimated at \$25,000.

22d.—Hailstorms of considerable severity were reported from portions of Illinois, Kansas, Nebraska, Oklahoma, and Georgia.

23d.—Torrential rains in southeastern Ohio, and in Marshall, Wetzel, and Tyler counties, W. Va., caused destructive floods in the tributaries of the Ohio, particularly the Little Muskingum. Cloud-bursts were also reported from Jeffersonville, Ind., and Hopkinsville Ky. Clark Co., Mo., was visited by a severe hailstorm.

24th.—A minor tornado passed over Clayton, Wis. Two persons were injured, six houses destroyed, and a few barns wrecked.

25th.—Severe thunderstorms passed over Detroit, Mich., and Creston, Iowa, houses were unroofed, and fences, chimneys, and awnings blown down.

27th.—A minor tornado passed over West Louisville, Ky.

One dwelling was wrecked, one person killed, and one injured. Damage about \$1,000.

The loss of life during the month was: By violent winds, 3; by lightning, 45.

## TEMPERATURE OF THE AIR.

[In degrees Fahrenheit.]

The mean temperature is given for each station in Table II, for voluntary observers. Both the mean temperatures and the departures from the normal are given in Table I for the regular stations of the Weather Bureau.

The *monthly mean temperatures* published in Table I, for the regular stations of the Weather Bureau, are the simple means of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

The *regular diurnal period* in temperature is shown by the hourly means given in Table V for 29 stations selected out of 82 that maintain continuous thermograph records.

The *distribution of the observed monthly mean temperature of the air over the United States and Canada* is shown by the dotted isotherms on Chart IV; the lines are drawn over the Rocky Mountain Plateau Region, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

The *highest mean temperatures* were: Yuma, 88.8; Galveston and Key West, 82.3; Corpus Christi, 80.6; Port Eads, 80.2. The lowest mean temperatures were: Tatoosh Island, 53.0; East Clallam, 53.4; Port Angeles, 53.8; Eureka, 54.0; Neahbay, 54.5; Port Crescent, 55.1; Pysht, Fort Canby, and Eastport, 56.4. Among the Canadian stations the highest were: Medicine Hat, 66.2; Spences Bridge, 65.9; Winnipeg, 65.0; Toronto, 64.1; Montreal, 63.6; Kingston, 63.4. The lowest were: St. Johns, 51.0; Banff, 52.6; Father Point, 52.3; Yarmouth, 54.6.

As compared with the normal for June the mean temperature for the current month was in excess over the Plateau Region, the Ohio Valley, and Lake Region, and deficient on the Pacific Coast. The greatest excesses were: Phoenix, 5.7; Abilene, 5.0; Swift Current, 4.8; Marquette, 4.4; Rapid City, Port Stanley, and Winnemucca, 4.2; Yuma, 4.0. The greatest deficits were: San Francisco, 2.6; Lynchburg, 2.4; Portland, Oreg., and Columbia, Mo., 2.1; New York, 1.8; Lexington and Charlotte, 1.7; Point Reyes Light, 1.6.

Considered by districts the mean temperatures for the current month show departures from the normal as given in Table I. The greatest positive departures were: Southern Slope (Abilene), 5.0; southern Plateau, 3.3. The greatest negative departures were: Middle Atlantic and north Pacific, 0.8.

The *years of highest and lowest mean temperatures* for June are shown in Table I of the REVIEW for June, 1894. The mean temperature for the current month was the highest on record at: Abilene, 83.1; Palestine, 81.6; Fort Smith, 78.4; Pueblo, 72.0; Santa Fe, 69.0; Idaho Falls, 62.4; Baker City, 59.6. It was the lowest on record at: Columbia, Mo., 72.8; Neahbay, 54.5.

The *maximum and minimum temperatures* of the current month are given in Table I. The highest maxima were: 117, Yuma (12th); 115, Phoenix (frequently); 106, Fresno (14th); 105, Abilene (8th), Walla Walla (28th); 104, Dodge City (14th); 103, El Paso (16th); 102, Redbluff (16th); 100, Oklahoma (15th), San Antonio (18th), Palestine (28th). The lowest maxima were: 64, Eureka (7th); 65, Point Reyes Light (23d); 69, Tatoosh Island (26th). The highest minima were: 73, Galveston (10th); 71, Key West (13th); 70, Port Eads (2d); 69, New Orleans (23d), Jupiter (14th),